

ATTACHMENT A REMARKS

Reconsideration of the rejection of the claims is respectfully requested for the reasons which follow.

Claims 1-22 have been rejected under 35 USC 102(b) as being "anticipated by" the Okunuki et al patent ("Okunuki"). This rejection is respectfully traversed.

Turning first to independent claim 1, this claim recites an ultrasonic apparatus including, inter alia, an acoustic front shell having a complex shape and an ultrasonic transducer adapted for swinging movement underneath the front shell and having a front surface of a shape conforming to the complex shape of the front shell. The purpose of the provision of the transducer having a front surface which conforms to the complex shape of the front shell is to eliminate any acoustic artifacts produced between the shell and the surface of the transducer.

It is respectfully submitted that the Okunuki patent does not disclose the arrangement claimed. In fact, as is clearly evident from Figure 4 (the figure reproduced by the Examiner in the Office Action and on which reliance is placed), a non-uniform space separates the surface 26A of the transducer 26 and the facing surface 24A of casing 24. As is also illustrated in Figure 4, the coupling fluid 60 that fills this non-uniform space is of greater depth at the end portions of the transducer surface 24A than at the central portion thereof. This variable depth affects the acoustic performance of the transducer. In any event, it is respectfully submitted that claim 1 is not anticipated by, and patentably defines over, Okunuki.

With respect to dependent claim 2, this claim recites that the apparatus comprises a mechanical probe, the transducer has a rotation axle, and the drive means comprises a motor mounted in direct driving relation with the transducer through the rotation axle of the transducer. Thus, the claimed motor is located in such a manner as to provide alignment of the motor axis with the rotational axis of the transducer, thereby simplifying the probe construction and reducing the overall volume of the probe. A much different arrangement is provided in the Okunuki patent wherein a motor 48 and associated gear 50 drive the transducer through an arrangement including a belt 52 and

rollers 53 to 56. Thus, it is respectfully submitted that claim 2 is separately patentable over the Okunuki reference.

Claim 3 depends from claim 1 and is patentable for at least the reasons set forth above in support of the patentability of claim 1.

Independent claim 4 is directed to "an ultrasonic curved array transducer" including, inter alia, "an external focusing lens made of silicon rubber and including a front face having a variable radius of curvature exactly corresponding to that of the front shell in front of the transducer." Claim 4 also recites that the variable radius of curvature varies "in a manner such as to minimize the distance separating the front face of the focusing lens and the internal surface of the shell" and further recites that a piezoelectric member for admitting and receiving ultrasonic energy has "a variable surface curvature compensating for the variable radius of curvature of the focusing lens in a manner such as to enable the transducer to maintain a common elevational focus for all transducer elements of the array transducer" and that the transducer has "an external elevation surface profile parallel to the corresponding internal profile of the front shell of the probe."

Again, it is respectfully submitted that these features are simply not disclosed in the Okunuki reference which, as discussed above, disclosed an arrangement wherein therein is variable, non-uniform spacing between the transducer front surface and the facing surface of the casing.

Turning to the dependent claims that depend from claim 4, claims 5-8 respectively recite that the piezoelectric member is of various different shapes defined in the individual claims. The Examiner contends that "Okunuki teaches various shapes of curved array ultrasonic transducer depending on their use as a sector scanning array or linear scanning array transducer" and refers to lines 49-60 of column 8. It is respectfully submitted that the lines in question merely state that although a convex type array transducer is depicted in Figure 5, the invention can be applied to a sector scanning array transducer, a linear scanning array transducer, etc. It is respectfully submitted that this is clearly not a teaching of the subject matter of claims 5-8.

Claim 9 recites that the piezoelectric member is made from a specific composite ceramic-polymer structure and is patentable for at least the reasons set forth above in support of the patentability of claim 4.

Independent claim 10 relates to "an ultrasonic probe comprising a moving array transducer wherein the transducer comprises "lips disposed at superior edges of the moving array transducer for retaining a quantity of coupling grease." This feature is simply not taught by nor in any suggested by the Okunuki reference and, in fact, is not addressed in the Office Action.

Dependent claims 11 and 12, which have been corrected to depend from claim 10 as was intended, are patentable for at least the reasons set forth above in support of the patentability of claim 10.

Independent claim 13 is directed to "an ultrasonic apparatus including, inter alia, a probe housing having an ovoid portion in which an array transducer is mounted and an ovoid-shaped carrier of a shape conforming to the surface of the probe housing." Claim 13 further provides that the motorization or motor is disposed at the central axis of the ovoid carrier for tilting or swinging the transducer around the longitudinal axis thereof. For ready reference, this claim is directed to the embodiment of Figures 15, 16 and 17.

Again, the Okunuki patent does not disclose an ovoid (egg-shaped) transducer much less any of the other features recited in claim 13 and it is respectfully submitted that claim 13 patentably defines over Okunuki.

Claims 14 to 22 depend from claim 13 and are patentable for the reasons set forth above in support of the patentability of claim 13. Further, a number of these claims recite features not disclosed in the Okunuki reference. For example, claim 17 recites that the ovoid carrier includes a central hollow space in which is located interconnection means for transducer elements of the array transducer. It is respectfully submitted that no such central hollow space is disclosed in the Okunuki patent and, in fact, the provision of such a central hollow space would not be possible with the arrangement shown in the Okunuki patent.

Claim 18 provides that the ovoid carrier comprises at least a first curved array transducer mounted at a first angular position and a second curved array transducer

mounted at a second angular position so as to enable the probe to simultaneously scan two distinct informational volumes. Again, this feature is simply not disclosed in, or suggested by, the Okunuki reference.

Regarding claim 22, this claim provides that the ovoid carrier is capable of rotating through an angle of more than 360° without damage to the interconnection means for the array transducer. The Examiner points to "virtual rotative axis" 32 of the Okunuki patent but it is respectfully submitted that this is not a teaching of the subject matter of claim 22.

Allowance of the application in its present form is respectfully solicited.

END REMARKS